ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Review Article

A CONCEPTUAL STUDY ON MODE OF ACTION OF *NASYA*

Vipin Kumar
Assistant Professor, Department of Panchkarma, BMU Rohtak, Haryana.

ABSTRACT

In *Ayurveda*, *Panchkarma* therapy is used for the maintenance of health and eradication of diseases from their root and *Nasya Karma* is one among them. In this therapy, the medicine is administered through nose either in the form of ghee, oil, powder, liquid or smoke. It is particularly useful in the treatment of diseases occurring in the organs situated above the clavicle but indirectly it works on the whole body by improving the functioning of the endocrine glands and nervous system. *Nasa* is said to be the main doorway to Shiras. *Nasyaaushadhi* reaches to brain via nasal route and acts on higher centers of brain controlling different neurological, endocrinal and circulatory functions and thus showing local as well as systemic effects. This administration of drugs through nasal route opens a new hope for the both local and systemic drug administration. Nasal route drug administration is a promising alternative route of drug administration for local, systemic and central nervous system action. So here a review is presented on mode of action of *Nasya* procedure according to *Ayurveda* and modern science.

KEYWORDS: *Nasya*, *Nasa*, *Shiras*, Mode of action.

INTRODUCTION

Nasal route of drug administration is the natural choice for the treatment of local nasal disorders as well as other supraclavicular diseases. This transmucosal nasal drug delivery is a non invasive drug administration route. Due to large surface area, high vascularity, avoidance of hepatic first pass metabolism and gut wall metabolism, it has occupied a very important place in the field of drug delivery technology. *Nasya* which means medication through nostrils is one among the five procedures mentioned in *Ayurveda* for eradication of diseases. The word *Nasya* is derived from "*Nasa*" *Dhatu*, which conveys meaning of *'Gati'*. Here the *Gati* is towards the internal structures mainly to head through nose. It is also called as *Shirovirechana* that implies removal of toxins from the head region. Unlike the other detoxification therapies which are focusing on the pacification of particular *Doshas*, this therapy is quite unique as it aims at pacification of any disorder in the head and neck region. To understand mode of action of *Nasya*, knowledge of *Nasa* and *Shiras* is necessary.

***Shiras*:** *Shira* (head) is considered as *Uttamanga* i.e. supreme, important and major part of the body where the life along with sense faculties resides.[1] *Aacharya Vagbhatta* has compared human being with a tree, with roots at the top and branches at the bottom and defined head as a site where all sense organs along with the *Prana* resides.[2]All the *Indriyas*, *Indriyavahi* and *Pranavaha Srotas* depend on the *Shiras* for their functions and all the sense organs and the channels carrying the sensory and vital impulses from the *Shiras* are like the rays from the sun.[3]

***Nasa*:** In *Ayurvedic* literature, there is no detail description of *Nasa Sharira* at one place. *Nasa* is included among the *Panchagyanendriya* as site of *Ghranendriya*. Its functions are not only limited to olfaction and respiration but also considered as a pathway for drug administration in the form of *Nasya*.

Anatomy and Physiology of nasal tract

To understand the drug absorption of the nasal route, it is compulsory to understand the anatomy and physiology of nasal tract and how it relates to the characteristics of the delivery system used. Nasal route runs from nasal vestibule to nasopharynx which has a depth of approximately 12-15 cm. Total surface area of nasal cavity is about 180cm^2 and it has total volume about 16-19 ml. Mucous lines this nasal route which protects the mucosa from the inspired air. Nasal route is divided into 3 functional zones:

1. Vestibular region
2. Respiratory region
3. Olfactory region

Vestibular region

Vestibular region is found at the opening of the nasal passage which is responsible for filtering the air coming in the nasal cavity. It is having least importance among three regions with regards to drug absorption.

Respiratory Region

It is mainly responsible for systemic drug absorption because it has highest degree of vascularity.

Olfactory Region

Olfactory region plays a very important role in transportation of drugs to the brain and CSF. Surface area of olfactory region is about 10 cm^2 .

Mode of action of *Nasya*

Ayurvedic view

According to *Aacharya Charaka*, *Nasa* is the portal (gateway) of *Shiras*. The drug administered through nose as *Nasya* reaches to the brain and eliminates only the

morbid *Doshas* responsible for producing the disease.[4]For explaining how *Nasya* removes *Doshas*, example of *Munja* and *Ishika* is given in the commentary of *Chakrapani*. According to *Chakrapani*, drug administered as *Nasya* enters into head and draws out exclusively morbid *Doshas* as *Ishika* is taken out after removing the fibrous coating of *Munja* adhered to it. In *Sushruta Samhita*, '*Mastulungagam'* (passage of brain matter i.e. CSF through nose) is symptom mentioned in *Atiyoga* (excess activity) of *Virechana Nasya*[5]. This shows that *Aacharya Sushruta* was already aware of the fact of relation between nose and brain.

In *Ashtanga Samgraha*, it is explained that *Nasa* being the door way to *Shira* (head), the drug administered through nostrils, reaches *Shringataka* by *Nasasrota* and spreads in the *Murdha* (Brain)) taking route of *Netra* (eye), *Shrotra* (ear), *Kantha* (throat), *Siramukhas* (opening of the vessels) etc. and scrapes the morbid *Doshas* in supraclavicular region and extracts them from the *Uttamanga*.[6] *Aacharya Sushruta* has clarified *Shringataka Marma* as a *Sira Marma* formed by the union of *Siras* (blood vessels) supplying to nose, ear, eye and tongue.[7] According to the commentator *Indu*, the exact *Sthana* of the *Shringatakamarma* is "*Shiraso Antarmadhya Murdha*" which can be considered for the middle cranial fossa. On basis of above facts, the verse i.e. "*Nasa Hi Shirsodwaram*" can be justified which reflexes the action of *Nasya* in head and systemic disorders.

Modern view

Nasal route is easily accessible, convenient, and reliable with a porous endothelial membrane and a highly vascularized epithelium that provides a rapid absorption of compounds into the systemic circulation, avoiding the hepatic first pass elimination. In addition, intranasal drug delivery enables dose reduction, rapid attainment of therapeutic blood levels, quicker onset of pharmacological activity, and fewer side effects. The nasal delivery seems to be a favorable way to bypass the obstacles for blood-brain barrier (BBB) allowing the direct drug delivery in the biophase of central nervous system (CNS) active compounds. It has also been considered to the administration of vaccines.[8] The pharmacodynamics of *Nasyakarma* can be explained in light of modern anatomical and physiological studies as follows:

1) Vascular pathway

The nasal tissue is highly vascularized making it an attractive site for rapid and efficient systemic absorption. Rich vascular plexus permits topically administered drugs to rapidly achieve effective blood levels while avoiding intravenous catheters. Vascular path transportation is possible through the pooling of nasal venous blood into the facial vein which occurs naturally. The facial vein has no valves. It communicates freely with the intracranial circulation. It communicates through pterygoid plexus with the cavernous venous sinus.[9]

2) Neurological pathway

Olfactory nerve is chemoreceptor in nature. It is known that through olfactory pathway this nerve is connected with limbic system and hypothalamus which are having control over endocrine secretions.[10] Moreover, hypothalamus is considered to be responsible for integrating the functions of the endocrine system and the nervous system. Electrical stimulation of hypothalamus in animals is capable of inducing secretions in the anterior pituitary. So the drugs administrated here stimulate the higher centers of brain which shows action on regulation of endocrine and nervous system functions.

3) Diffusion through nasal mucosa

In the absorption of drug from the nasal cavity first step is passage through the mucus. Large and charged particles may find it more difficult to cross. But small and uncharged particles easily pass through this layer. Mechanisms for absorption of drug through the nasal mucosa include

1. Paracellular route is the first mechanism which isan aqueous route of transport. This is slow and passive route.

2. Transcellular process is the second mechanism of transport through a lipoidal route and is responsible for the transport of lipophilic drugs that show a rate dependency on their lipophilicity. Drugs also cross cell membranes by an active transport route via carrier mediated means or transport through the opening of tight junctions.[11]

Advantages of nasal route drug administration

- Avoidance of liver first pass effect
- Fast onset of therapeutic effect
- Rapid absorption, higher bioavailability
- Avoidance of metabolism by GIT
- Non invasive

Limitations of nasal route drug administration

- Risk of local adverse effects and irreversible damage to the cilia of nasal mucosa
- In high concentration some chemical enhancer may disrupt and even may dissolve membrane
- Due to improper administration of the drug, there could be a mechanical loss of the doses into other parts of respiratory tract i.e. lungs etc.

DISCUSSION

According to *Ayurveda*, nose is gateway for head. *Nasya Karma* is the process which eliminates the vitiated *Doshas* of the *Urdhvanga* ensuring the smooth functioning of the brain and ultimately whole body. To explain the pathway of *Nasya Karma* i.e. delivery of drug from nose to brain, the following factors can be considered-

- Recommendation of *Nasya* by Ancient *Aacharyas* for mental disorders like *Apasmara*, *Unmada* and in *Pumsavana Karma* for changing the sex of the fetus. The drugs used for *Pumsavana* may be acting through this olfacto –hypothalamo-pituitary pathway.
- Pooling of blood from nasal veins to venous sinuses of the brain is more likely to occur in head lowering position due to gravity and thus absorption of drug into meninges and related intracranial organ is a point of consideration. Administered drug enters into the intracranial region by direct pooling and systemic circulation by vascular path.
- It may possible that *Nasyaaushadhi* through neurological pathway works as perception of smell is received through olfactory pathway and thus

controlling various nervous and endocrinal diseases. This fact can also be supported by indication of *Nasya* in diseases like *Pakshaghata, Avabahuka, Manyastambha, Ardita, Sangyanash, Murchha, Galganda, Aruchi,* sleep disorders etc.

- Lipid form of medicine facilitates drug absorption. Maximum *Kalpas* used for *Nasya* are prepared in lipid base.
- The procedure of *Nasya* includes *Purva Karma, Pradhana Karma* and *Paschata Karma*. The preoperative procedures of *Nasya Karma* play a major role in the access of the drug into the body. The lowering of the head, elevation of lower extremities and fomentation of face seems to have an impact on blood circulation of the head and face.[12]Abhyanga causes *Mriduta* of *Doshas* and according to modern science massage to a specified area causes increased blood circulation. *Swedana* causes *Vilayana* (liquefaction) of accumulated *Doshas* (mucous). Lowering of head plays a major role in retaining the instilled medicine in the nose and thus increasing the contact time with mucosa. In *Paschata Karma* of *Nasya, Urdhvanga* massage, *Swedana, Dhoompana* and *Kavalagraha* is advised. These measures increase the efficacy of the treatment and help to drain out the remaining *Utklishta Doshas*. Thus the procedures, postures and conducts explained for *Nasya Karma* are of great importance for drug absorption and transportation.

CONCLUSION

It can be concluded that the *Nasyaaushadhi* reaches to brain via nasal route and acts on higher centers of brain controlling different neurological, endocrinal and circulatory functions and thus showing local as well as systemic effects. This administration of drugs through nasal route opens a new hope for the both local and systemic drug administration. Nasal route drug administration is a promising alternative route of drug administration for local, systemic and central nervous system action. It has advantages in terms of reduction of systemic exposure and hence side effects. Thus relevancy of "*Nasa Hi Shirasodwaram*" can be proved which ultimately explains the mode of action of *Nasya*.

REFERENCES

1. Agnivesha, Charaka Samhita, Vidyotini Hindi commentary by Pt. KashinathaShastri and Dr.Gorakha Natha Chaturvedi, Sutra Sthana 17/12, Chaukhambha Bharati Academy, Varanasi, Reprint 2005, Pg. no. 332
2. Vagbhata, Ashtangahridayam, Uttara Sthana 24/58, Vidyotini Hindi Commentary by Kaviraja Atrideva Gupta, Chaukhambha Prakashan, Varanasi, Reprint 2010; Pg. no. 734
3. Agnivesha, Charaka Samhita, Vidyotini Hindi commentary by Pt. Kashinatha Shastri and Dr. Gorakha Natha Chaturvedi, SidhiSthana 9/4, Chaukhambha Bharati Academy, Varanasi, Reprint 2005, Pg. no. 1051
4. Agnivesha, Charaka Samhita, Vidyotini Hindi commentary by Pt. Kashinatha Shastri and Dr. Gorakha Natha Chaturvedi, SidhiSthana 2/22, Chaukhambha Bharati Academy, Varanasi, Reprint 2005, Pg. no. 986
5. Sushruta, Sushruta Samhita, Ayurveda Tattva Sandipika Hindi commentary by Kaviraja Ambikadutta Shastri, Chikitsasthana 40/40, Chaukhambha Sanskrit Sansthan, Varanasi, Edition: Reprint 2009, Pg. no. 227
6. Vagbhata, Ashtangasamgraha with Hindi commentary by Kaviraj Atridev Gupta, Sutra sthana 29/2, Chowkhamba Krishnadas Acadmy, Edition: Reprint 2005, Pg. no. 216
7. Sushruta, SushrutaSamhita, Ayurveda Tattva Sandipika Hindi commentary by Kaviraja Ambikadutta Shastri, Sharirasthana 6/28, Chaukhambha Sanskrit Sansthan, Varanasi, Edition: Reprint 2009, Pg. no. 75
8. Pagar Swati Appasaheb et al., A review on intranasal drug delivery system, J. Adv. Pharm. Edu. & Res., 2013: 3(4): 333-346
9. Gray's Anatomy – 35th edition, Pg. no.884
10. C. Guyton and John E. Hall. Textbook of medical physiology. Chapter - 53, Saunders. 11th edition, reprint 2006, Pg. no. 669
11. Rahisuddin et al., Review on nasal drug delivery system with recent advancement, Int. J. Pharm. Pharm. Sci., Vol. 3, Suppl. 2, 2011, 6-11
12. Ian S Mackay, T R Bull. Scott-Brown's Otolaryngology, Butterworth International 5th Edition 1987; Volume-4 Rhinology, Pg. no. 83

Cite this article as:
Vipin Kumar. A Conceptual Study on Mode of Action of Nasya. International Journal of Ayurveda and Pharma Research. 2017;5(7):100-102.
Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**
Dr. Vipin Kumar
Assistant Professor,
Department of Panchkarma, BMU Rohtak, Haryana.
Email: vipinwhynot@gmail.com
Mobile No. 8239889891